

[CASE REPORT]

Three Cases of Food Poisoning Due to *Paralepistopsis acromelalga* Diagnosed from an Outbreak of Erythromelalgia

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Abstract:

A married couple of a 62-year-old woman and a 64-year-old man as well as their neighbor, an 84-year-old woman, visited the hospital complaining of a burning sensation on their hands and feet that had presented on the same day. They had consumed mushrooms that had been picked on a mountain five days before the onset of the symptoms. The symptoms were attributed to *Paralepistopsis acromelalga*. In conclusion, asking about the dietary history is considered essential when diagnosing the cause of erythromelalgia, which has multiple causative diseases, including food poisoning due to *P. acromelalga*.

Key words: toxicology, dokusasako, food poisoning, erythromelalgia, intoxication

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Introduction

The presentation of *Paralepistopsis acromelalga* intoxication is characterized by erythromelalgia without gastrointestinal symptoms after a few days' incubation. In the present case series, three patients presented with chief complaints of erythromelalgia symptoms on the same day and were diagnosed with *P. acromelalga* intoxication.

We herein report these three cases along with a literature review.

Case Reports

Case 1

A 62-year-old woman presented with burning sensation and numbness in her both limbs. She had a 2-year history of well-controlled diabetes and was taking sitagliptin tablet 50 mg and metformin tablet 250 mg. Two days before the visit, she had developed a burning sensation on both hands and feet, and the symptoms had persisted for two days. The symptoms were exacerbated by standing up and bearing weight while walking along with warm stimulation, such as

bathing. No other concomitant symptoms, including gastrointestinal symptoms, were noted.

On a physical examination, her body temperature was 36.7°C, pulse 78/minute, blood pressure 132/80 mmHg, and oxygen saturation 98% on room air. Her consciousness was E4V5M6. Her condition appeared normal except for the redness of her bilateral hands and feet. The sensation was intact. Her muscle strength was difficult to evaluate since the pain was exacerbated by flexion and extension in both wrists and ankles.

She was hospitalized for the investigation of the symptoms. Since her husband had the same symptoms, she was suspected of having a contagious condition. A food history was obtained, revealing that she had consumed cooked mushrooms, which her husband had collected from a mountain, along with miso soup five days before the onset. Notably, the mushrooms had been shared with her family and neighbors. Suspecting poisoning by mushrooms, we called the health department. The local health center sent a mushroom expert to carefully check the mushrooms and identified the sample as *P. acromelalga* (Dokusasako, poisonous dwarf-bamboo mushroom) on the same day of the presentation. Finally, a diagnosis of food poisoning caused by *P. acromelalga* was made.

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Since the pain was extremely strong, she was prescribed acetaminophen (2,400 mg/day from day 1 of hospitalization) and pregabalin (100 mg/day starting from day 15 of hospitalization, increased to 300 mg/day over two weeks on an outpatient basis after discharge on day 18 of hospitalization). In addition, nicotinic acid (50 mg/day from day 3 to day 9) infusion was started. Although the interventions for the pain were ineffective, two weeks after hospitalization, she became able to walk up to 10 m. Two weeks after discharge, she presented for follow-up at the clinic in a wheelchair, wearing a cooling patch on her soles to mitigate the burning sensation, and was prescribed loxoprofen (180 mg/day from day 50 after the onset on an outpatient basis after discharge).

Eventually, the patient had difficulty living at home and was admitted for the second time 27 days after discharge (47 days after the onset of the disease). On day 4 of the second hospitalization, she was started on 20 mg of morphine, which was ineffective. An epidural block was proposed, but she declined the treatment.

She gradually regained the ability to walk much longer distances and was discharged after 21 days in the hospital for her second admission. She tried to continue to stay at her home despite the pain. However, she eventually could no longer bear the pain and therefore visited the hospital due to the pain, and she was ultimately admitted to the hospital to obtain pain relief. After being admitted to the hospital, she wanted to be discharged from the hospital, trying to somehow get back to living at home once the pain subsided somewhat, and she was actually once discharged, but her symptoms eventually worsened and then she had to again be readmitted to the hospital. The pain continued to spike for one to two months. She was torn between staying at home in pain and returning to the hospital where she could receive medical care. When she returned home, the pain became intolerable, and her mobility was largely limited to within the home, even after the second discharge, whereas when she was admitted to the hospital, she received personal care.

Around a month after the second discharge from the hospital, she finally was able to actually able to walk some distance, such as around her home and to go shopping. Two months after the onset of the disease, she gradually began to return to her normal life, except for a burning sensation in her extremities.

Case 2

A 64-year-old man, who was the husband of the Case 1 patient, presented with a burning sensation in both limbs. The patient had no significant medical history and was not receiving any regular medications. The case presentation is much the same as that in Case 1, presenting with painful swelling with redness on his hands and feet that was worsened by warming or mechanical pressure and had started five days after consuming mushrooms. No other concomitant symptoms, including gastrointestinal symptoms, were noted. His vital signs on presentation included a body tem-

perature of 37.5°C, a pulse of 80/minute, blood pressure of 151/76 mmHg, and oxygen saturation of 98% on room air. He was alert, and his consciousness was E4 V5M6.

He was hospitalized and diagnosed with poisoning by *P. acromelalga* as in Case 1. He was then prescribed tramset[®] (fixed-dose combination of acetaminophen and tramadol, acetaminophen dose of 1,300 mg, tramadol 150 mg equivalent) while in the hospital and then nicotinic acid drip therapy (50 mg only on day 4 of hospitalization, the day of discharge), in order. However, like Case 1, he showed no treatment response.

On day 4 in the hospital, the pain persisted, but he could stand and walk while enduring the pain and was thus discharged of his volition to return to his job. However, he was hospitalized a second time on day 10 after the onset of the disease because the pain was too much to bear, and during the second hospitalization, he was prescribed the same amount of tramset[®], which was just as ineffective as at the first admission. He was ultimately hospitalized for 11 days. The pain did not lessen markedly, and he eventually gave up on recovering from the pain and was discharged again at his own will.

He was too busy with his work to continue seeing his physician as scheduled. Therefore, he stopped going to follow-up visits after he was discharged from the hospital. However, his wife (Case 1) said that he was able to walk as much as usual about one month after the onset, although the burning sensation persisted for six months.

Case 3

An 84-year-old woman who was a neighbor of Cases 1 and 2 presented with the same symptoms on the same day of presentation as Cases 1 and 2. She complained of a burning sensation in her extremities. At the time, she had already been prescribed etizolam tablet 1.0 mg, esomeprazole capsule 10 mg, verapamil tablet 40 mg three times a day, furosemide tablet 20 mg, digoxin tablet 0.125 mg, spironolactone tablet 25 mg, montelukast tablet 10 mg, and budesonide/Formoterol inhalant for insomnia, reflux esophagitis, chronic heart failure, and bronchial asthma. Of note, she had never previously had either edema or dyspnea, and she did not recall the clinical course or remember the onset of bronchial asthma and heart failure.

Four days before the onset of the symptoms, she had consumed mushrooms that had been shared by Cases 1 and 2 with miso soup. On the same day of presentation as Cases 1 and 2, she presented with a burning sensation and pain and was subsequently hospitalized for the evaluation of her symptoms. Following hospitalization, she was given tramset[®] (fixed-dose combination of acetaminophen and tramadol, acetaminophen dose of 1,300 mg, tramadol 150 mg equivalent, days 4-33 of hospitalization), which was ineffective. There was some concern of disuse syndrome due to pain. She received direct hemoperfusion therapy with activated carbon (hemosorba[®] CHS-350, QB: 150 mL/h, 2 hours each time, 3 times in total on days 3-5 in the hospital)

based on the case report literature (1), but the degree of pain remained unchanged.

She was hospitalized for three months and received rehabilitation. Although the burning sensation began to diminish about one month after the onset, she continued to have difficulty walking because of disuse and was later admitted to an elderly care facility.

Discussion

We experienced three cases that simultaneously developed *P. acromelalga* intoxication (Dokusasako, poisonous dwarf-bamboo mushroom). The toxic component of *P. acromelalga* is acromelic acid, which has a chemical structural formula resembling that of kainate acid, so the agonist action via glutamate receptor exerts toxicity (2). Unlike many other poisonous mushrooms, the symptoms are not characterized by gastrointestinal symptoms but rather by the delayed onset of erythromelalgia symptoms after three to seven days' incubation (3). The pain lasts for more than a month, during which the extremities, especially the distal sites, are particularly red and swollen, a condition that is exacerbated by warm stimulation, such as bathing, and alleviated by cooling. The main focus of the treatment is symptomatic treatment with analgesia until its natural remission. Acetaminophen, NSAIDs, pregabalin, and morphine have been considered ineffective, and while nicotinic acid infusion or blood purification therapy has been reported effective has been reported (4), none of these options were effective in the present cases.

Regarding the differences in the clinical course and symptoms among the present cases, with respect to Cases 1 and 2, the husband (Case 2) had only had one cup of miso soup that contained *P. acromelalga*, whereas the wife (Case 1) had prepared the soup and thus consumed a greater amount, equivalent to several cups. This difference in the intake may have led to a dose-dependent relationship in symptoms. However, Case 2 said that, despite his pain, there were social demands that forced him to go to work. Cases 1 and 2 had pain that did not abate for as long as two months after onset. As noted above, the patients were discharged after hospitalization in an attempt to somehow return to life at home once their pain had subsided somewhat, but they eventually had to be readmitted due to a worsening symptoms. This meant that during those two months, the patients had to be repeatedly hospitalized and discharged. We did not notice even a slow, slight recovery trend until one to two months after the onset of the disease. Previous reviews suggest that recovery occurs within eight days to five months, usually without any residual effects (5). Regarding Case 3, the amount of mushroom intake was unspecified. However, the patient was too frail to take time to recover and to become ambulatory compared with the other cases because of her age and medical background. We were able to follow the symptoms of Case 1 in the outpatient clinic, and we then obtained information about her husband (Case 2) from

the patient (Case 1). However, we were unable to follow the symptoms Case 3 experienced after being discharged from the hospital because she entered an institution for the aged and was lost to follow-up. As in these cases, *P. acromelalga* poisoning has a diverse course, and further cases need to be accumulated in the future.

The differential diagnoses of acute and severe pain on the extremities, which appear as erythromelalgia, are numerous (6) and include autoimmune diseases, poisoning, infections, reflex dystrophy, and other etiologies of polyneuritis. Making a correct diagnosis is sometimes difficult, but what was helpful in the present cases is that all three patients had similar symptoms and a history and presented on the same day, enabling physicians to make a swift and accurate diagnosis. Interviews revealed that all three cases had consumed the same soup made from mushroom collected in the mountains. That mushroom turned out to be *P. acromelalga*. The patients complained of burning pain aggravated by warm sensations, so the pathogenesis of erythromelalgia was easy to determine.

As described above, mushrooms that cause erythromelalgia have been reported in Japan and the southern part of the Korean peninsula (*P. acromelalga*), as well as in France (*P. amoenolens*), and all have been associated with symptoms with a delayed onset of several days after consumption (7). When we encounter patients with an acute onset of erythromelalgia, it is important to consider a diagnosis of mushroom poisoning.

The authors state that they have no Conflict of Interest (COI).

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